

# DDM SERIES

Desiccant Dryer Mobile  
Drying of free-flowing granular plastic materials



# Desiccant Dryer Mobile - DDM

## Introduction

Labotek's series of mobile desiccant dryers, DDM, is designed for the continuous drying of free-flowing plastic raw materials in granulate form. The DDM has been energy optimized and is available as a complete desiccant drying and integrated dry air conveying system to processing machine, based on proven, reliable and energy saving design. The standard temperature range is 60 to 140°C with a preset deviation of +/- 2°C. A HT (High Temperature) model is also available with a temperature range of 60 to 180°C. Owing to the extremely accurate temperature control and a dew point of <-35°C, a final moisture content of less than 0.02% can be achieved (HT model 0.002%).

## DDM series offers...

- Small footprint of only 0.82 m<sup>2</sup>
- Drying hopper capacities of 60, 120, 180 and 225 litres
- Electrical 3 phase power supply, no compressed air needed
- Unique dry air conveying system to process machine
- Built-in 3 phase conveying system to dryer (SVR)
- Dew point connection gate
- A separate over temperature thermostat
- Comprehensive 3 year warranty, excluding wear parts

## Touch Screen Control

DDM is operated via the microprocessor-based, 6" colour touch screen control.

The touch screen is menu driven, using basic symbols and enabling easy operator interface. Furthermore the control features shortcuts to the most basic functions, i.e. drying temperature settings, drying time, start/stop timer for drying and conveying settings.

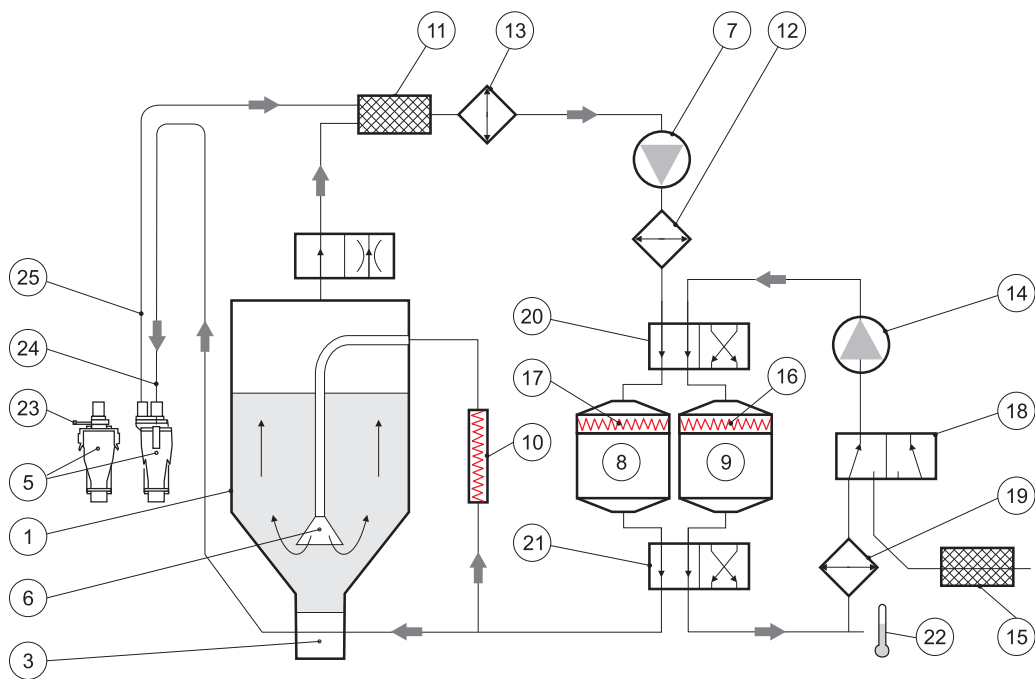


## LESS - Labotek Energy Saving System

Labotek Energy Saving System has been designed to achieve energy savings of the drying air that is fed to the drying hopper, as well as providing protection against over drying.

The current drying temperature can be lowered by an optionally selected number of degrees from the set drying temperature. Lowering of the temperature and reset to normal drying temperature are automatically controlled by the return air temperature. The LESS system in DDM, operates using relative lowering of drying temperature after reaching the set value. Temperature reduction will begin when the material has been dried.





## Drying

The desiccant air blower (7) circulates the drying air in a closed system. The air is dried in one of the two desiccant beds (8) or (9), and the dew-point temperature is lowered to approx.  $-35^{\circ}\text{C}$ . The dry air heating element (10) is used to heat the drying air to the required temperature before, via the air separator (6), it is distributed in the drying hopper DH (1).

After the drying air has heated the raw material and transformed the moisture to water vapour, it is led back through the dust filter (11) to the blower (7). The humid air is cooled in the structural frame (12) of the machine just before it is led to one of the desiccant beds (8) and (9) which will adsorb the humidity. In HT units the air is cooled through the cooler (13).

## Regeneration

The DDM dryer has two desiccant beds (8) and (9) with molecular sieves for dehumidification of the drying air. One of the beds is always operative in the drying cycle whereas the other is either regenerating in the regeneration cycle or, when fully regenerated, in standby mode.

Regeneration occurs when hot air passes through the desiccant bed (8) or (9).

The regeneration blower (14) takes in ambient air through the intake filter (15) and sends it to the regeneration heating element (16) or (17) where the air temperature is increased to approx.  $140^{\circ}\text{C}$ . The moisture adsorbed in the desiccant bed is evaporated and forced into the ambient air in the form of water vapour. In the last phase of the regeneration cycle, the regeneration heating element (16) or (17) is disconnected and as the position of the regeneration valve (18) changes, the air is re-circulated in a closed system. This is done to cool the molecular sieve through a cooling frame (19), and to lower the dew point temperature to approx.  $-35^{\circ}\text{C}$ . In HT units the cooling frame (19) is cooled by water.

Two automatic, double-acting valve units (20) and (21) are placed at the inlet and the outlet of the

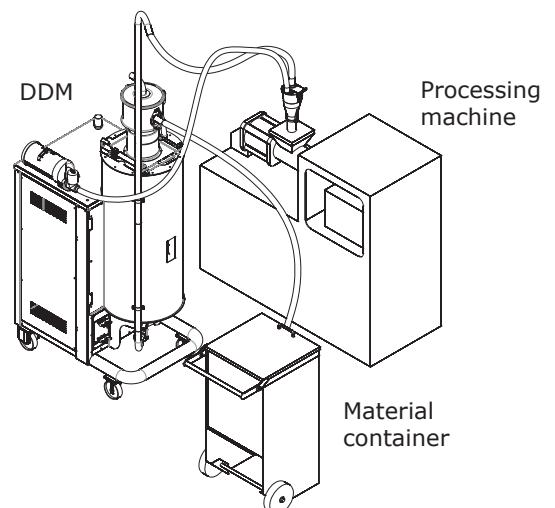
desiccant beds ensuring that one of the desiccant beds is always operative in the drying cycle and the other in the regeneration cycle. Time between regenerations is variable and calculated according to moisture pick-up, monitored in microprocessor control and regeneration sensor (22).

## Conveying

Raw material is fed automatically into the machine hopper proportional to the consumption of the processing machine.

The principle is that part of the blower (7) drying air is bypassed and sent to the injector (3) whereby the dried raw material is sucked from the drying hopper utilising the injector effect. The injector is adjustable. It can be adjusted to match size and shape of the granular material. Consequently, most types of regrind can be conveyed.

The raw material is blown from the injector (3) to the air separator (5) which is either located directly on the machine hopper or fitted on the barrel inlet using a special intermediate flange. Conveying is initiated by the slide valve (23) inside the air separator. Conveying air is now fed from the material hose (24) into the return air hose (25). Conveying stops automatically when the machine hopper has been fully loaded, thus blocking the air passage between (24) and (25).



# Technical Data

DDM Type	DDM 60	DDM 120	DDM 180	DDM 225
Supply Voltage	3 x 50/60 Hz 380-480 V			
Installed Power, kW	8.6 / 9.0	9.0 / 9.3	9.0 / 9.5	11.0 / 11.5
<b>Blower, drying</b>				
Blower motor, drying - 3 Phase 50 / 60 Hz, kW	1.1 / 1.4	1.1 / 1.4	1.3 / 1.5	1.3 / 1.5
Air volume m <sup>3</sup> /h - 50 / 60 Hz	36 / 43	100 / 120	100 / 120	115 / 138
Water column [mm]	1400 / 1680	2400 / 2880	2400 / 2880	2600 / 2800
<b>Blower, regeneration</b>				
Blower motor, regeneration - 3 Phase 50 / 60 Hz, kW	0.37 / 0.44	0.37 / 0.44	0.37 / 0.44	0.37 / 0.44
Dew point, temp. °C	Better than -35°C			
Heating element, Drying - kW	2.5 / 2.5	3.5 / 3.5	3.5 / 3.5	4.5 / 4.5
Heating element, Drying HT version - kW	2.5 / 2.5	5.0 / 5.0	5.0 / 5.0	6.5 / 6.5
Heating element, Regeneration - kW	2 x 3.5 / 3.5	2 x 3.5 / 3.5	2 x 3.5 / 3.5	2 x 3.5 / 3.5
Cooling water requirement - HT version	Max. pressure: 8 bar-flow 250 l/h-cooling water temp. In/out 15/40°C			
Noise level (dBA)	63	65	63	65
Drying Hopper, sizes (litre)	60	120	180	225
Desiccant beds	2	2	2	2
Conveying hose, inner Ø [mm] / length [m]	38 / 2.5	38 / 2.5	38 / 3.5	38 / 3.5
Return air hose, inner Ø [mm] / length [m]	32 / 3	32 / 3	32 / 4	32 / 4
Telescopic suction probe, Ø [mm]	32 / 38	32 / 38	32 / 38	32 / 38
Vacuum Receiver	SVR 4	SVR 8	SVR 8	SVR 16
Air separator	1	1	1	1
Connecting cable [m]	3	3	3	3
Net weight [kg] / Shipping weight [kg]	288 / 312	285 / 309	298 / 322	312 / 336
Shipping volume [m <sup>3</sup> ]	2.03	2.03 0.27	1.92 0.27	1.92 0.27
Shipping dimensions [mm]	1200 x 800 x 2120	1200 x 800 x 2120 870 / 570 / 550	1200 x 800 x 2000 870 / 570 / 550	1200 x 800 x 2000 870 / 570 / 550

## DDM 180 Energy Consumption for Drying & Conveying

Material type	ABS	PC	PA6.6	PBT	PMMA
Output in kg/h	54	42	27	46	39
Drying temperature	80°C	120°C	80°C	120°C	90°C
Drying time	2 hour	3 hour	4 hour	3 hour	3 hour
Total energy per hour	2.63 kWh	2.98 kWh	2.36 kWh	3.35 kWh	2.57 kWh
Energy per kg	0.048 kWh	0.070 kWh	0.087 kWh	0.072 kWh	0.065 kWh

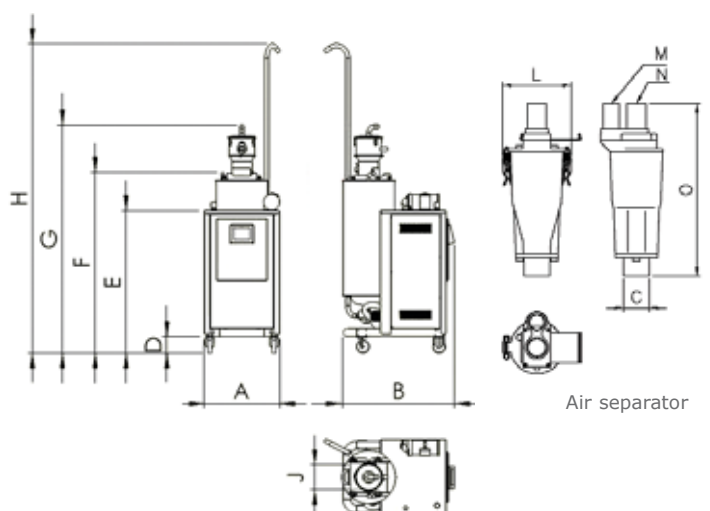
## Dimensions

	A	B	C	D	E	F	G
DDM 60	740	1165	Ø 51	155	1397	1516	2060
DDM 120	740	1165	Ø 51	155	1397	1726	2138
DDM 180	740	1203	Ø 51	155	1497	1567	2138
DDM 225	740	1203	Ø 51	155	1497	1848	2380

	H	J	L	M	N	O
DDM 60	3222	275	136	Ø 32	Ø 38	440
DDM 120	3455	275	136	Ø 32	Ø 38	440
DDM 180	3220	275	136	Ø 32	Ø 38	440
DDM 225	3455	275	136	Ø 32	Ø 38	440

All measurements are in mm.



Air separator

## Capacity table for desiccant dryers

Raw material		Recommended dry time [h]	Recommended drying temp. °C	Drying capacity kg/h at bulk density 0.6			
				DDM 60	DDM 120	DDM 180	DDM 225
ABS	Acrylonitrilebutadiene-styrene	2-3	80	18-12	36-24	54-36	70-45
PA	Polyamide 6/6.6/10	3	75-80	12	24	36	45
PA	Polyamide 11/12	4	75-80	9	18	27	34
PBTP	Polybutylene terephthalate	3	120	12	24	36	45
PC	Polycarbonate	2-3	120	18-12	36-24	54-36	70-45
PE	Polyethylene	1-2	80-90	36-18	72-36	108-54	135-67.5
PE	Polyethylene, black	3-4	90	12-9	24-18	36-27	45-34
PEC	Polyester carbonate	4-5	130	9-7	18-14	27-22	34-28
PEEK	Polyaryletherketone	2-3	150	18-12	36-24	54-36	70-45
PEI	Polyetherimide	3-4	150	12-9	24-18	36-27	45-34
PET	Polyethylene terephthalate	4-6	170-180	9-6	18-12	27-18	34-23
PETG	Polyethylene terephthalate glycol	4	66	9	18	27	34
PETP	Thermoplastic polyester	2-3	120	18-12	36-24	27	34
PI	Polyimide	2-3	120	18-12	36-24	54-36	70-45
PMMA	Methylmethacrylate polymer	2-3	80	18-12	36-24	54-36	70-45
POM	Polyacetal	2-3	100	18-12	36-24	54-36	70-45
PP	Polypropylene	1-2	80-90	36-18	72-36	108-54	135-67.5
PPO	Polyphenylene oxide	2	110	18	36	54	70
PPS	Polyphenylene sulphide	3-4	150	12-9	24-18	36-27	45-34
PPSU	Polyether sulfone	3-4	120	12-9	24-18	36-27	45-34
PS	Polystyrene	1-2	80	36-18	72-36	108-54	135-67.5
PSU	Polysulfone	2-3	130	18-12	36-24	54-36	70-45
PUR	Polyurethane	2-3	90-100	18-12	36-24	54-36	70-45
PVC	Polyvinyl chloride	1	70	36	72	108	135
SAN	Styrene acrylonitrile	2-3	80	18-12	36-24	54-36	70-45
SB	Styrene butadiene (high impact)	1-2	80	36-18	72-36	108-54	135-67.5
TPE	Polyester elastomer	2-3	110	18-12	36-24	54-36	70-45
TPR	Thermoplastic rubber	3	75	12	24	36	45

The above capacity table states recommended values only, based on the drying of the specific materials down to a residual moisture content of 0.02% which, however, will vary depending on the type of material. The capacities are based on a general bulk density of 0.6 with the exception of PE and PETG to which a bulk density of 0.55 and 0.85 respectively forms basis.

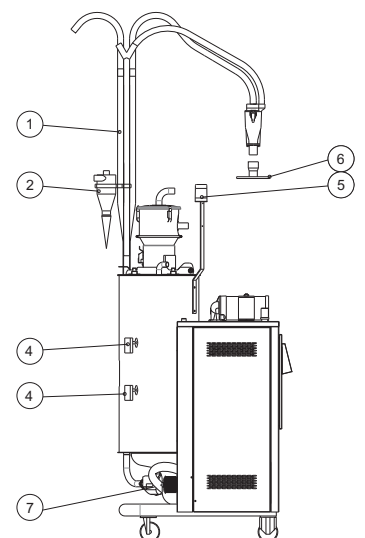
Pos.	Description	LT no.
1	Double conveying 1>2 DDM	202885
2	Cyclone, dust separation, with plastic container	208861
2	Cyclone, dust separation, with plastic bag	208862
4	Level Control	203671
5	Warning lamp, DDM, flash lamp, yellow/blinking, 24 V AC	208863
5	Warning lamp, DDM, flash lamp, yellow/blinking/sound, 24 V AC	208864
6	Flange for air separator Ø 50 mm, DDM	202500
-	IDV. DDM 60 - Ø 38 mm	208970
-	IDV. DDM 120, 180 - Ø 38 mm	208971
-	IDV. DDM 225 - Ø 38 mm	208972
7	By-Pass assembly for DDM	208865
-	Tropical execution	208995

## Options

The DDM is prepared for a number of options to ensure optimal treatment of the material being processed.

Tropical execution DDM for high ambient conditions (up to 45°C with 90% RH).

The DDM can be customized to your specified production. Please refer to our separate brochure for special designs.





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